CLAIMS

1.   A method for controlling the operation of a structure for processing fuzzy inferences comprising corresponding antecedents defined by atomic conditions identified from membership functions, the atomic conditions also identifying corresponding operands of the antecedents, the method comprising the operations of:

organizing in the structure, for a quantity included among the membership functions and the operands, a corresponding store for storing the values of the quantity which are already available; and

checking, at a time of identification of a new value of the quantity, whether the new value is already present in the corresponding store.

2.   The method according to claim 1, further comprising the operation of identifying the new value with a corresponding value already present in the corresponding store.

3.   The method according to claim 1, further comprising, in relation to the membership functions, the operations of:
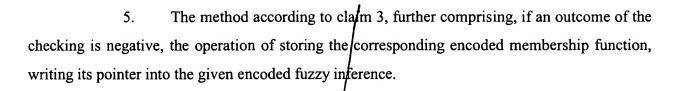
encoding the fuzzy inferences and corresponding membership functions;

establishing a pointing mechanism from the encoded fuzzy inferences to the corresponding encoded membership functions;

checking whether a given encoded fuzzy inference points to an encoded membership function which is already present in the corresponding store; and

acting on the pointing mechanism according to whether the encoded membership function is already present in the corresponding store.

4.   The method according to claim 3, further comprising, if an outcome of the checking is positive, the operation of redirecting the pointer of the given encoded fuzzy inference towards the encoded membership function already present in the corresponding store.

5.   The method according to claim 3, further comprising, if an outcome of the checking is negative, the operation of storing the corresponding encoded membership function, writing its pointer into the given encoded fuzzy inference.

6.   The method according to claim 3 wherein a given one of the encoded fuzzy inferences corresponds to a plurality of encoded membership functions and the operation of acting on the pointing mechanism is carried out for all the encoded membership functions of the given encoded fuzzy inference and for all the encoded fuzzy inferences to be stored.

7.   The method according to claim 1, further comprising, in relation to the operands, the operations of:

providing, in the structure, a function for calculating the operands from corresponding calculation parameters; and

disabling, at least partially, the calculation function when it is found that a corresponding operand value is already present in the corresponding store.

8.   The method according to claim 1, further comprising, in relation to the operands, the operations of:

providing, in the structure, a function for calculating the operands from corresponding calculation parameters;

configuring the corresponding store for the storage of the operands and of the corresponding calculation parameters; and

scanning the corresponding store on the basis of the corresponding calculation parameters, identifying a corresponding operand value already present in the corresponding store on the basis of corresponding calculation parameters already present in the corresponding store.

9.   The method according to claim 8 wherein the corresponding calculation parameters are an input variable of the structure and a pointer to the corresponding membership function.

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10. The method according to claim 1, further comprising, in relation to the operands, the operation of organizing the corresponding store in the form of a stack organized for an ordered loading of new values of the operands from an uppermost position with downward shifting of the values already present in the corresponding store.

11. The method according to claim 10, characterized in that it comprises, when it is found that the new value of one of the operands is already present in the corresponding store, the operation of moving the new value which is already present to the uppermost position of the corresponding store.

12. A processing structure for processing fuzzy inferences comprising corresponding antecedents defined by atomic conditions identified from membership functions, the atomic conditions also identifying corresponding operands of the antecedents, the processing structure comprising:

for a quantity included among the membership functions and the operands, a corresponding store for storing values of the quantity which are already available; and

a processing unit configured in order to check, at a time of identification of a new value of the quantity, whether the new value is already present in the corresponding store.

13. The structure according to claim 12, wherein the processing unit identifies the new value of the quantity with a corresponding value already present in the corresponding store.

14. The structure according to claim 12, further comprising a processing unit operating in relation to the membership functions and configured to:

encode the fuzzy inferences and corresponding membership functions;

establish a mechanism for pointing from the encoded fuzzy inferences to the corresponding encoded membership functions;

check whether a given encoded fuzzy inference points to an encoded membership function already present in the corresponding store; and

act on the pointing mechanism according to whether the membership function is already present in the corresponding store.

15.   The structure according to claim 14, wherein the processing unit, operating in relation to the membership functions, redirects, if the outcome of the check is positive, the pointer of the given encoded fuzzy inference towards the encoded membership function already present in the corresponding store.

16.   The structure according to claim 14 wherein the processing unit, operating in relation to the membership functions, carries out, if the outcome of the check is negative, the storing of the corresponding encoded membership function, writing its pointer into the given encoded fuzzy inference.

17.   The structure according to claim 14 wherein a given one of the encoded fuzzy inferences corresponds to a plurality of encoded membership functions and the processing unit is configured to act on the pointing mechanism for all the encoded membership functions of the given encoded fuzzy inference and for all the encoded fuzzy inferences to be stored.

18.   The structure according to claim 12 wherein the processing unit is structured to execute a function of calculating the operands from corresponding calculation parameters, and also a disabling function to disable, at least partially, the calculation function when it is found that a corresponding operand value is already present in the corresponding store.

19.   The structure according to claim 12 wherein the processing unit is structured to calculate the operands from corresponding calculation parameters, wherein:

the corresponding store is configured to store the operands and the corresponding calculation parameters, and

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the processing unit, operating in relation to the operands, scans the corresponding store on the basis of the corresponding calculation parameters, identifying a corresponding operand value as already present in the corresponding store on the basis of corresponding calculation parameters already present in the corresponding store.

20.   The structure according to claim 19, wherein the processing unit uses, as the corresponding calculation parameters, an input variable of the structure and a pointer to the corresponding membership function.

21.   The structure according to claim 12 wherein the corresponding store is organized as a stack, configured for an ordered loading of the new values of the operands from an uppermost position with downward shifting of the values of the operands already present in the corresponding store.

22.   The structure according to claim 21, wherein the processing unit acts on the corresponding store, when it is found that a corresponding operand value is already present in the corresponding store, to move the operand value which is already present to the uppermost position of the corresponding store.

23.   A processing structure for processing an input fuzzy inference that includes plural corresponding input membership functions, the processing structure comprising:

a membership function storage device for storing encoded membership functions; and

fuzzy inference encoding means, coupled to the membership function storage device, for encoding the input fuzzy inference into an encoded fuzzy inference, including for each of the input membership functions:

encoding the input membership function into an encoded input membership function;

comparing the encoded input membership function to the stored encoded membership function;

if a stored encoded membership function is found to match the encoded input membership function, then storing with the encoded fuzzy inference a pointer to the matching stored encoded membership function; and

if none of the stored encoded membership functions is found to match the encoded input membership function, then storing the encoded input membership function in the membership function storage device and storing with the encoded fuzzy inference a pointer to the stored encoded input membership function.

24.   The structure according to claim 23, further comprising a fuzzy inference storage unit coupled to the fuzzy inference encoding means and structured to store the encoded fuzzy inference.

25.   The structure according to claim 23, further comprising:

an alpha storage device for storing alpha values; and

fuzzy inference control means, coupled to the alpha storage device and to the membership function storage device, for receiving a fuzzy input, for receiving from the membership function storage device an encoded membership function corresponding to the fuzzy input, and determining whether the alpha storage device stores an alpha value corresponding to the fuzzy input and corresponding encoded membership function.

26.   The structure according to claim 25 wherein the fuzzy inference control means includes output means wherein if a stored alpha value is found to correspond to the fuzzy input and corresponding membership function, the output means outputs the corresponding stored alpha value.

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27. The structure according to claim 25, further comprising:

alpha calculation means for calculating an alpha value corresponding to the fuzzy input and corresponding encoded membership function wherein the fuzzy inference control means includes means for interrupting the calculation of the alpha value by the alpha calculation means if a stored alpha value is found to correspond to the fuzzy input and corresponding membership function.

28. The structure according to claim 25 wherein the alpha storage device is organized as a stack of alpha values with each alpha value in the stack corresponding to a respective fuzzy input and a respective pointer to an encoded membership function stored in the membership function storage device.

29. A processing structure for processing a fuzzy input, comprising:

an alpha storage device for storing alpha values;

alpha calculation means for receiving the fuzzy input and a membership function corresponding to the fuzzy input and calculating an alpha value corresponding to the fuzzy input and corresponding membership function; and

fuzzy inference control means, coupled to the alpha storage device and alpha calculation means, for:

receiving the fuzzy input and corresponding membership function;

determining whether the alpha storage device stores an alpha value corresponding to the fuzzy input and corresponding membership function; and

if a stored alpha value is found to correspond to the fuzzy input and corresponding membership function, outputting the corresponding stored alpha value.

30. The structure according to claim 29 wherein the fuzzy inference control means includes means for interrupting the calculation of an alpha value by the alpha calculation means if a stored alpha value is found to correspond to the fuzzy input and corresponding

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membership function and the alpha calculation means includes means for outputting the calculated alpha value if not interrupted by the fuzzy inference control means.

31.   The structure according to claim 29, further comprising a membership function storage device that stores a plurality of membership functions wherein the alpha storage device is organized as a stack of alpha values with each alpha value in the stack corresponding to a respective fuzzy input and a respective pointer to a membership function stored in the membership function storage device.